HALLEY'S COMET

and the Universe of Meteors, Asteroids, and Lesser Comets

Patricia King
Margaret Frieske

C.C. PUBLICATIONS, INC.

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Halley's Comet software operates on Apple* IIe, Apple IIc, Apple II+, and Franklin computers. The software runs on a single disk drive.

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TABLE OF CONTENTS

INTRODUCTION 1
Instructional Design
Important Features

THE PROGRAM 2
Objectives
About Comets
Halley's Comet
Lesser Comets
Meteoroids, Meteors, and Meteorites
Asteroids
Telescopes and Observatories
Worksheets
Error Routine

OPERATION 4
Technical Information
Loading
Preview
Beginning a Lesson
Commands Summary

PRONUNCIATION KEY TO PROPER NAMES 6

WORKSHEETS 7

INTRODUCTION

Halley's Comet is a one-disk program designed to teach students some of the basic concepts of astronomy. The program lessons are organized in a logical sequence to promote concept development, and each lesson contains built-in checks to test mastery of the material. Animated graphic sequences illustrate the movement of particles of matter in space.

The software describes the origin, composition, and basic characteristics of comets, meteors, and asteroids. One of six sections is devoted to the phenomenon of Halley's Comet, and another introduces telescopes and observatories. The program is appropriate for students who read at a third grade level and above.

The package includes one disk, five reproducible worksheets, and a user's manual. The disk is compatible with Apple II +, Apple IIe, Apple IIc, and Franklin computers.

Instructional Design

The software consists of six self-contained lessons that are presented in a logical sequence. Concepts developed early in the program are useful for understanding later sections, but each lesson may be completed independently. Students choose any of the topics listed below from the menu.

1. ABOUT COMETS
2. HALLEY'S COMET
3. LESSER COMETS
4. METEOROIDS, METEORS, AND METEORITES
5. ASTEROIDS
6. TELESCOPES AND OBSERVATORIES

Each lesson alternates instruction with testing.

1. Students read and study factual information highlighted with graphic illustrations, including several animated sequences.
2. Students answer a series of questions that appear at intervals throughout each lesson. These relate specifically to preceding information.
3. A worksheet exercise accompanies every lesson.

Students progress through each lesson by correctly answering questions relating to the material. Incorrect answers route students back to the screen containing the relevant facts. Students review ***only*** the information they have not yet mastered.

Important Features

1. Students can operate the program with minimal teacher guidance.
2. Full color, high-resolution graphics, including several animated sequences, highlight key points to be learned.
3. Students review only the information they have not yet mastered.
4. Teachers can adjust the program for quick and easy preview.
5. Graphics of the solar system show proportionally accurate distances between the planets and the sun, and all orbits depict comets moving in the correct direction.
6. Five reproducible worksheets reinforce students' comprehension of the material.
7. Students are interactively involved with the program.
8. The program is easy to use. Required entries are limited to selected keys.
9. Students receive immediate feedback in response to both correct and incorrect answers.
10. The program makes efficient use of limited classroom time on the computer.
11. Information displays combining text and animated graphics provide an effective method of instruction.
12. Students can easily return to the menu or exit the program at any time.

THE PROGRAM

Each lesson incorporates questions at selected intervals to test mastery of the concepts presented. Students advance through the lesson as they successfully complete each series of questions.

Teachers may advance through the program without having to answer questions by using the Preview option. Instructions for this option are in the section entitled OPERATION.

Objectives

Objectives for each lesson are briefly outlined below.

About Comets

- Students will be able to describe some historical myths concerning comets.
- Students will be able to describe the basic composition of a comet.
- Students will name the parts of a comet.
- Students will define a comet's orbit and period.

Halley's Comet

- Students will be able to describe Edmund Halley's achievements.
- Students will draw the orbit of Halley's Comet.
- Students will identify the planets in the solar system.*

Lesser Comets

- Students will be able to name the distinguishing characteristics of Encke's Comet, Biela's Comet, and Comet Kohoutek.

Meteoroids, Meteors, and Meteorites

- Students will define a meteoroid, meteor, and meteorite.
- Students will be able to describe the origin, composition, and some basic characteristics of meteoroids, meteors, and meteorites.
- Students will be able to describe the formation and relative occurrence of meteorite craters.

Asteroids

- Students will define an asteroid and pinpoint the region of greatest asteroid concentration in the solar system.
- Students will name the largest and smallest asteroids.
- Students will be able to describe the possible origin and formation of asteroids.

Telescopes and Observatories

- Students will define an observatory and name two different types of observatories.
- Students will be able to describe the function of a lens.
- Students will be able to explain the difference between a refracting and a reflecting telescope.
- Students will name the components of a refracting and a reflecting telescope.

Students are directed back to the menu after the completion of each lesson.

*Pluto is depicted at its median distance from the sun.

Worksheets

A worksheet exercise, designed to reinforce the concepts learned from the software, is part of each lesson. Five reproducible worksheets are included in the ***Halley's Comet*** package for this purpose. Instructions to students for completing worksheet exercises are displayed onscreen as the students reach the appropriate points in the software.

Error Routine

Any incorrect answer quickly routes students back to the screen that contains the information necessary to answer the question correctly. After students read this, they return directly to the question, without having to step through intervening material.

OPERATION

Technical Information

Halley's Comet software operates on Apple II +, Apple IIe, Apple IIc, and Franklin computers. The software runs on a single disk drive. Although it is not necessary, use of a color monitor increases the visual appeal of the graphics.

Loading

1. Make sure the power switch is off.
2. Insert the ***Halley's Comet*** disk into the disk drive. If there are two disk drives, insert it into drive #1.
3. Turn the power switch on. Turn on the monitor.
4. If you wish to preview the program, press P as soon as the title screen appears.
5. Loading is complete when the introductory welcome screen appears.

Preview

The Preview function allows you to step through the entire program while pressing only the RETURN key. This eliminates the delay involved in choosing a correct answer and entering it. Simply continue to press RETURN and you will advance through the program.

To use Preview, press P when the title screen appears (as you are loading the program).

Beginning a Lesson

You may wish to familiarize yourself with the program before presenting it to your students. Listed below are the steps necessary to proceed through a lesson in the ***Halley's Comet*** program. (Other than a brief introduction, however, students will need no guidance to operate the program.)

1. Make a folder consisting of the five reproducible worksheets included in the package, and give one to each student before he begins the program. If possible, provide colored pencils to use on the worksheets.
2. Load the software and read through the introductory message. Press RETURN whenever you see the arrow symbol on the right-hand side of the screen.
3. Select a lesson from the menu by pressing an arrow key or the space bar. Press RETURN.
4. During a lesson, you may inadvertently press the wrong key (for example, #1 when you know the answer is #3). To correct this, simply press the left arrow key and enter a new number.
5. If you wish, you can return to the menu screen from within a lesson by pressing CONTROL-C. (Press them simultaneously.)
6. After completing a lesson, press RETURN to select another lesson from the menu.

End a session by merely removing the disk and turning off the machine. Never remove a disk when the disk light is on.

Commands Summary

Arrow keys:	Select lesson from menu. Change answer.
Space bar:	Select lesson from menu.
1 through 4:	Answer questions.
RETURN key:	Enter menu selection. Enter answer. Advance program.
P:	Preview program. (Effective only while program is loading.)
CONTROL-C:	Return to menu.
CONTROL-RESET:	Reboot program. (Start over.)

PRONUNCIATION KEY TO PROPER NAMES

Biela, Wilhelm Von	(BEE-la)
Ceres	(SEAR-eez)
Encke, Johann Franz	(ENG-key)
Halley, Edmund	(HAL-ee)
Icarus	(ICK-ur-us)
Kohoutek, Lubos	(Ka-HOE-teck)

HALLEY'S COMET
Worksheet #1

Name: _____

Label the parts of a comet.

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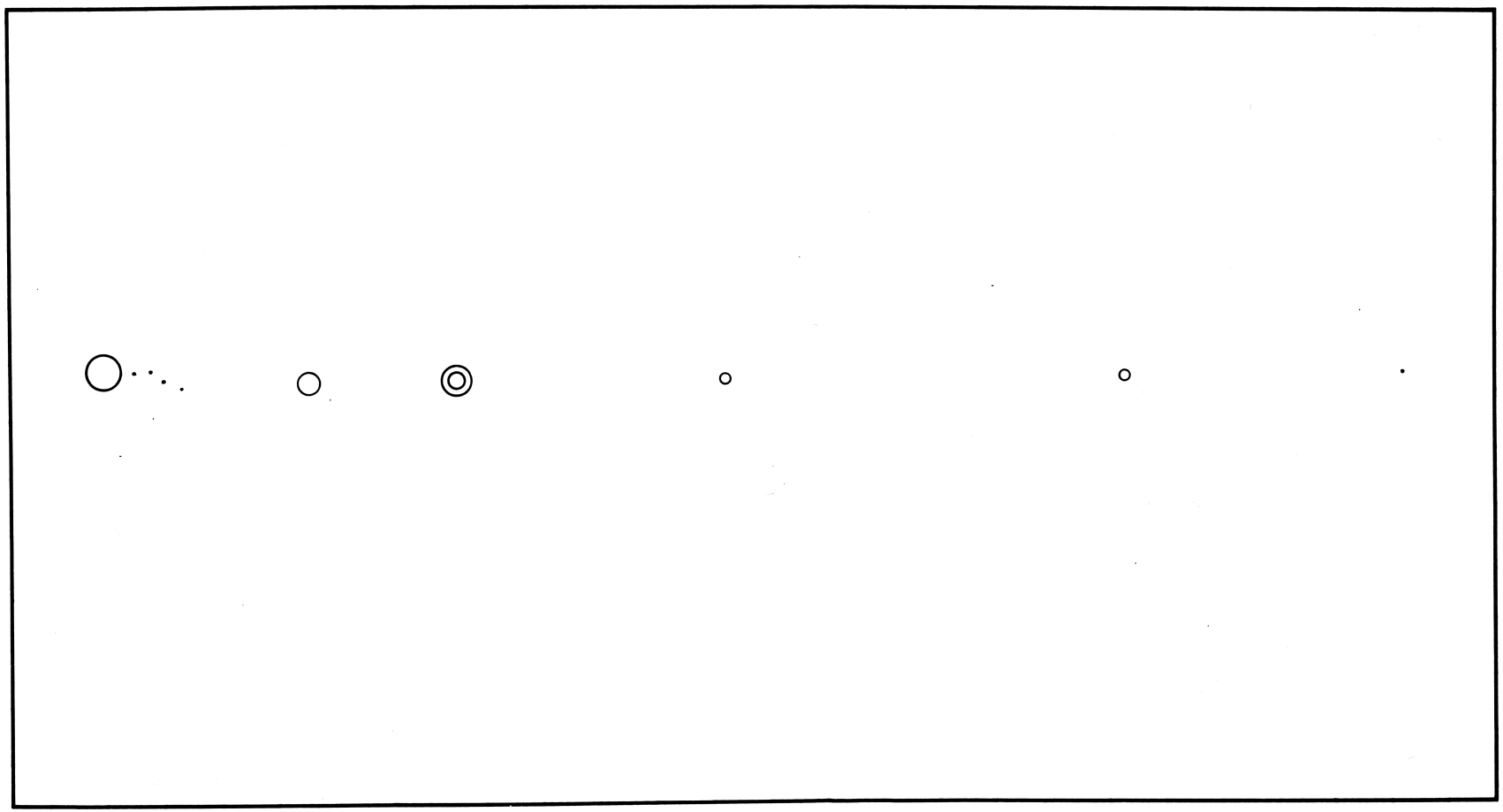
HALLEY'S COMET

Name: _____

Worksheet #2



1) Label the sun and the planets.

2) Draw and label the orbit of Halley's Comet.

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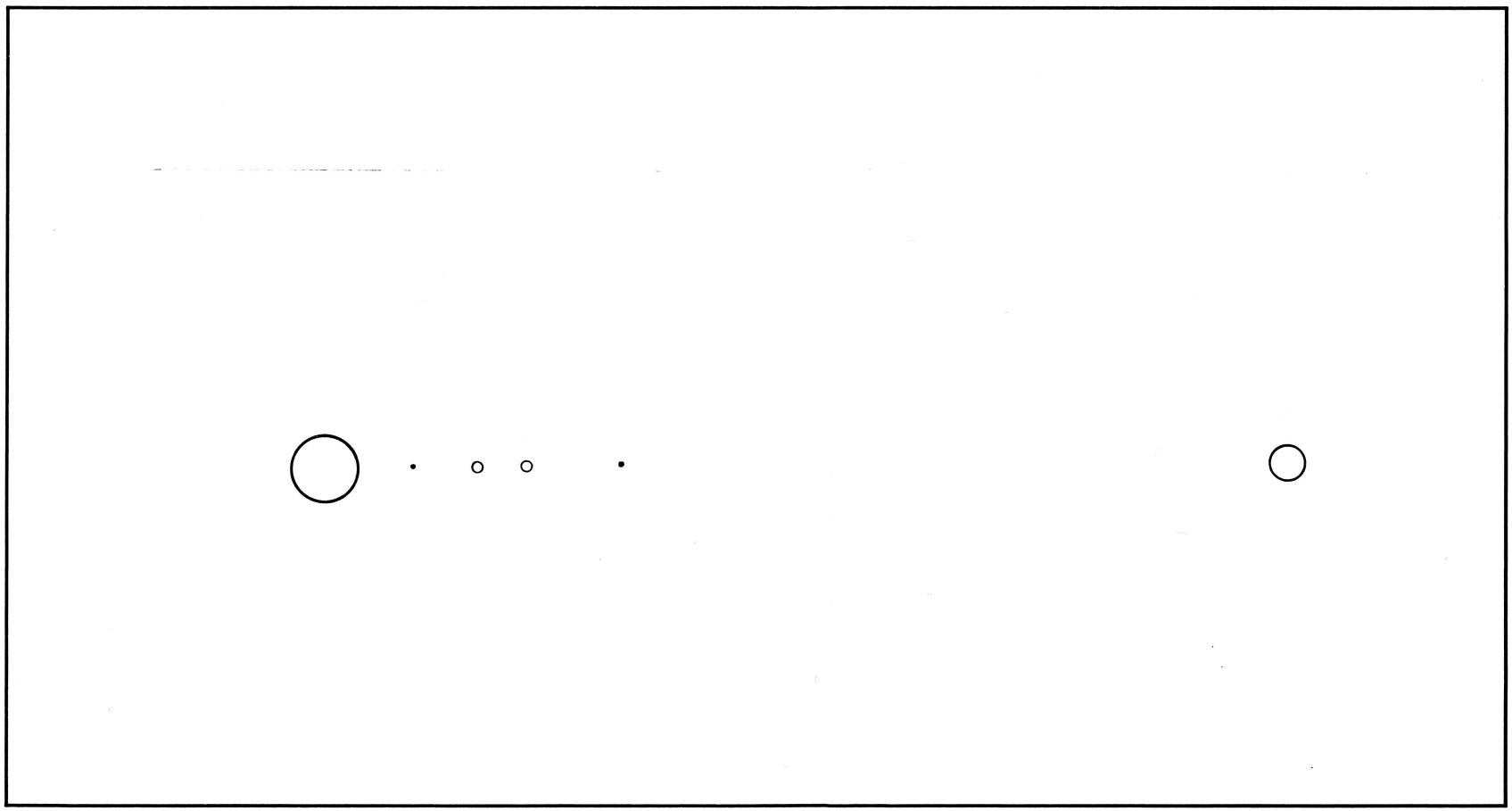
HALLEY'S COMET
Worksheet #3

Name: _____



1) Label the sun and the planets.
2) Draw and label the orbit of Encke's Comet.
3) Draw and label the asteroid belt.

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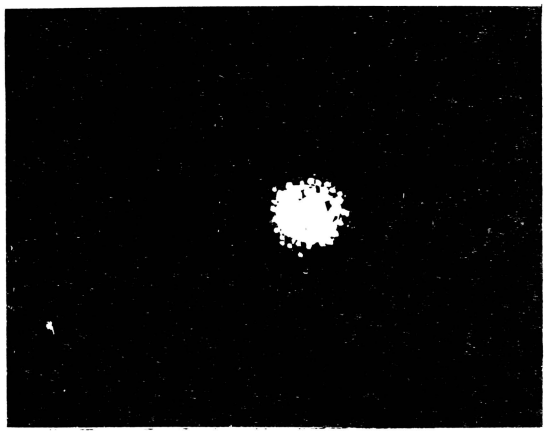
HALLEY'S COMET
Worksheet #4

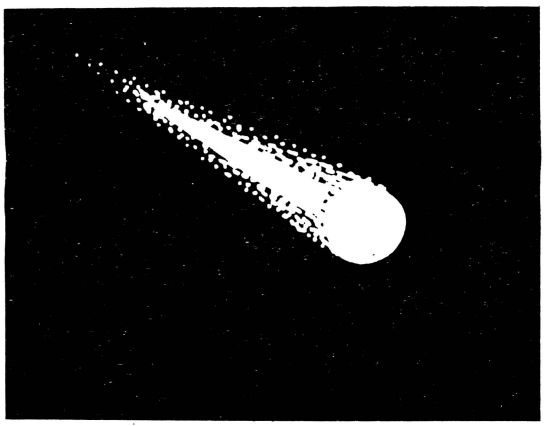
Name: _____

Fill in the correct label for each picture.



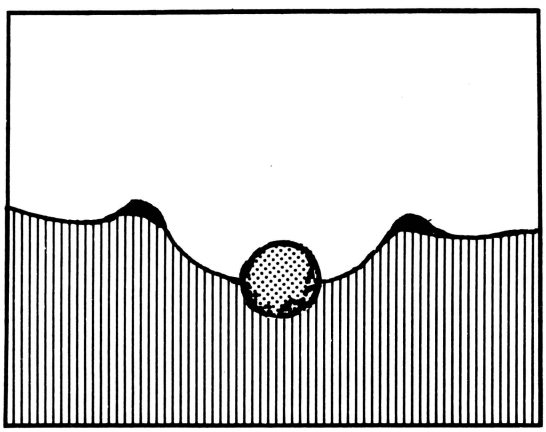
_____

A particle of matter moving through outer space.



_____

A particle of matter that has entered the Earth's atmosphere.



_____

The part of a meteor that remains after hitting Earth's surface.

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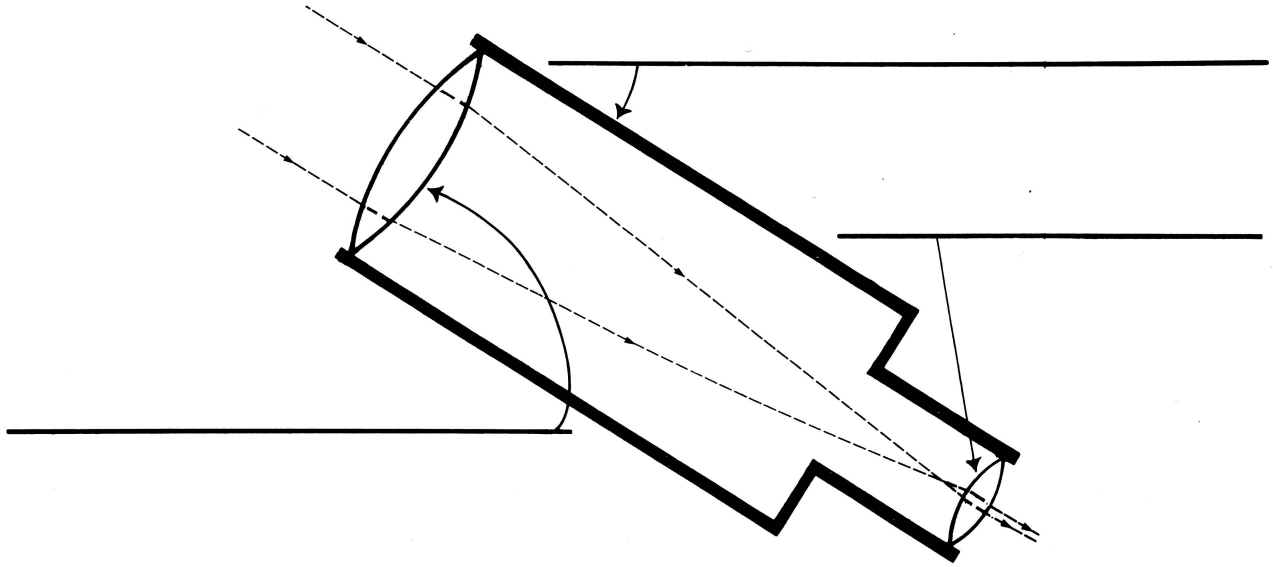
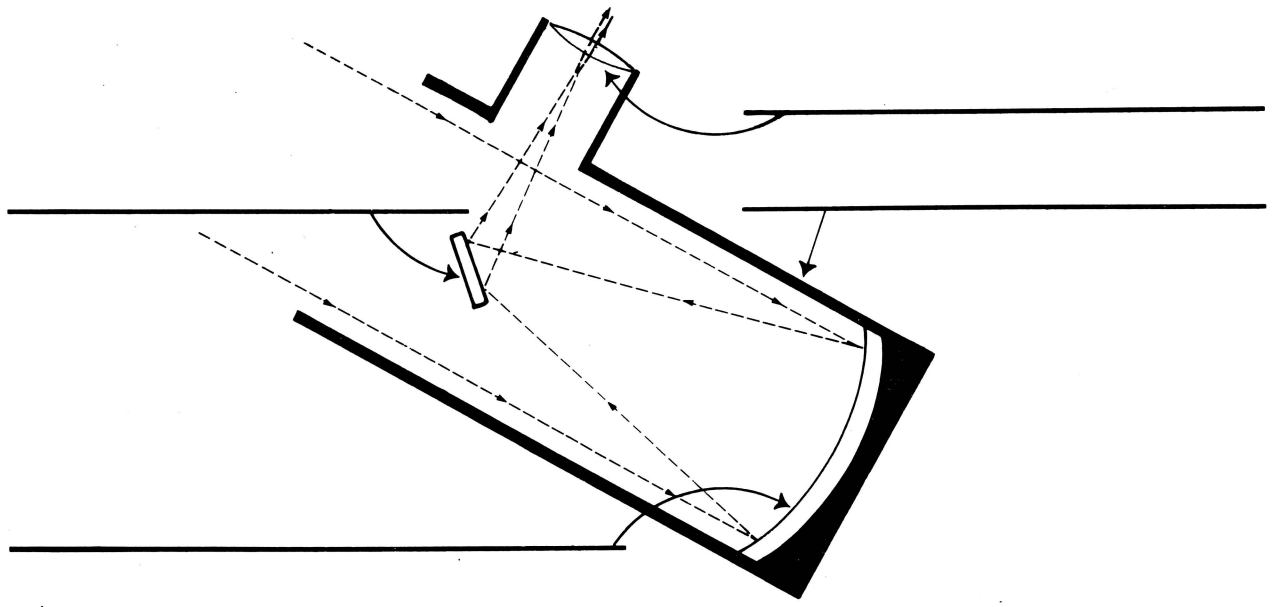
HALLEY'S COMET
Worksheet #5

Name: _____

Label the parts of a refracting telescope.



Label the parts of a reflecting telescope.



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